

Appl. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A process for the preparation of a water-absorbent polymer which comprises:
 - (I) polymerizing a polymerization mixture comprising:
 - (a) one or more ethylenically unsaturated carboxyl-containing monomers,
 - (b) one or more crosslinking agents,
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer,
 - (d) a polymerization medium, and
 - (e) a chlorine- or bromine-containing oxidation agent to form a crosslinked hydrogel;
 - (II) comminuting the hydrogel to particles; and
 - (III) drying the hydrogel at a temperature of greater than 105°C;wherein from about 1 to about 3 ppm, based on the weight of monomers (a), (b), and (c), of Fe(II) ions or Fe(III) ions or a mixture of both are added to the hydrogel prior to, during or after the comminution step (II) but prior to substantial drying of the hydrogel in step (III).
2. (Currently amended) A process for the preparation of a water-absorbent polymer which comprises:
 - (I) polymerizing a polymerization mixture comprising:
 - (a) one or more ethylenically unsaturated carboxyl-containing monomers,

Appl. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

- (b) one or more crosslinking agents,
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer,
 - (d) a polymerization medium, and
 - (e) a chlorine- or bromine-containing oxidation agent to form a crosslinked hydrogel;
- (II) comminuting the hydrogel to particles; and
- (III) drying the hydrogel at a temperature of greater than 105°C; wherein Fe(II) ions or Fe(III) ions or a mixture of both are added in an amount of from 1 to 3-20 ppm, based on the total weight of monomers, to the polymerization mixture prior to step (I).

3. (Currently amended) A process for the preparation of a water-absorbent polymer which comprises:

- (I) polymerizing a polymerization mixture comprising:
- (a) one or more ethylenically unsaturated carboxyl-containing monomers,
 - (b) one or more crosslinking agents
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer,
 - (d) a polymerization medium, and
 - (e) a chlorine- or bromine-containing oxidation agent to form a crosslinked hydrogel;
- (II) comminuting the hydrogel to particles; and
- (III) drying the hydrogel at a temperature of greater than 105°C; wherein from about 1 to about 3 ppm, based on the weight of monomers (a), (b), and (c), of Fe(III) ions are added to the polymerization mixture prior to step (I).

4. (Currently amended) A process for the preparation of a water-

Appl. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

absorbent polymer which comprises:

- (I) polymerizing a polymerization mixture comprising:
 - (a) one or more ethylenically unsaturated carboxyl-containing monomers,
 - (b) one or more crosslinking agents,
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer, and
 - (d) a polymerization medium to form a crosslinked hydrogel;
- (II) comminuting the hydrogel to particles;
- (III) applying to the hydrogel a chlorine- or bromine-containing oxidation agent prior to, during or after the comminution step (II); and
- (IV) drying the hydrogel at a temperature of greater than 105°C; wherein Fe(II) ions or Fe(III) ions or a mixture of both are added to the hydrogel in at least one of the following steps:
 - ~~(i) prior to the comminution step (II) or~~
 - ~~(ii) after the comminution step (II) but prior to substantial drying of the hydrogel in step (IV).~~

5. (Currently amended) A process for the preparation of a water-absorbent polymer which comprises:

- (I) polymerizing a polymerization mixture comprising:
 - (a) one or more ethylenically unsaturated carboxyl-containing monomers,
 - (b) one or more crosslinking agents,
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer, and

Appln. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

- (d) a polymerization medium to form a crosslinked hydrogel;
- (II) comminuting the hydrogel to particles;
- (III) applying to the hydrogel a chlorine- or bromine-containing oxidation agent prior to, during or after the comminution step (II); and
- (IV) drying the hydrogel at a temperature of greater than 105°C; wherein Fe(II) ions or Fe(III) ions or a mixture of both are added in an amount of from 1 to 3-20 ppm, based on the total weight of monomers, to the polymerization mixture prior to or during step (I).

6. (Currently amended) A process for the preparation of a water-absorbent polymer which comprises:

- (I) polymerizing a polymerization mixture comprising:
 - (a) one or more ethylenically unsaturated carboxyl-containing monomers,
 - (b) one or more crosslinking agents,
 - (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer, and
 - (d) a polymerization medium to form a crosslinked hydrogel;
- (II) comminuting the hydrogel to particles;
- (III) applying to the hydrogel a chlorine- or bromine-containing oxidation agent prior to, during or after the comminution step (II); and
- (IV) drying the hydrogel at a temperature of greater than 105°C; wherein from about 1 to about 3 ppm, based on the weight of monomers (a), (b), and (c), of Fe(III) ions are added to the polymerization mixture prior to step (I).

7. (Original) The process of Claim 1 further comprising (IV) grinding, screening and heat treating the dried hydrogel after step (III).

Appln. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

8.-16. (Cancelled)

17. (Currently amended) The process of Claim 1 wherein the Fe(II) ions are derived from iron (II) acetate, iron (II) chloride, iron (II) sulfate, iron (II) acetate, iron (II) bromide, iron (II) citrate, iron (II) lactate, ~~or~~ iron (II) nitrate, ~~or~~ and mixtures thereof.

18. (Currently amended) The process of Claim 1 further comprises a surface crosslinking step after step (III) ~~(III*)~~.

19. (Currently amended) The process of Claim 1 wherein the Fe(III) ions are derived from iron (III) chloride, iron (III) sulfate, iron (III) bromide, iron (III) citrate, iron (III) lactate, iron (III) nitrate, ~~or~~ iron (III) oxalate, ~~or~~ and mixtures thereof.

20. (Cancelled)

21. (Currently amended) The process of Claim 1 wherein the chlorine- or bromine-containing oxidizing agent is selected from the group consisting of sodium chlorate, potassium chlorate, sodium bromate, potassium bromate, sodium chlorite, ~~and~~ potassium chlorite, ~~or~~ and mixtures thereof.

22.-26. (Cancelled)

27. (Currently amended) A process for the preparation of a water-absorbent polymer, the process comprising

(I) polymerizing a polymerization mixture comprising:

- (a) one or more ethylenically unsaturated carboxyl-containing monomers.
- (b) one or more crosslinking agents,
- (c) optionally one or more comonomers copolymerizable with the carboxyl-containing monomer, and
- (d) a polymerization medium, and to form a crosslinked hydrogel,

(II) comminuting the hydrogel to particles; and

Appln. No. 10/517,572
Response A dated 6/30/2006
Reply to Office Action of April 13, 2006

(III) drying the hydrogel at a temperature of greater than 105°C;
wherein, under conditions sufficient to reduce the residual monomer level in the polymer product, the following are independently added to the process prior to substantial drying of the hydrogel in step (III): (a) from about 1 to about 3 ppm, based on the weight of monomers (a), (b), and (c), of Fe(III) ions; and (b) at least one chlorine- or bromine-containing oxidation agent.

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